

The Examiner has rejected claims 8-13 under 35 U.S.C. § 103(a) for obviousness over Japanese Patent Document JP 8288482 (we believe the Examiner intended to refer to JP 8288582, hereinafter "the '582 document") or Japanese Patent Document JP 8301695 (hereinafter "the '695 document").

The Examiner asserts that the '582 document discloses the process of irradiating an optical material containing an activator selected from a rare earth element or transition metal element with a light including such wavelength as the "potential curve of the ion of activating agent is in excited state" prior to valence number conversion. The Examiner concludes that a laser is used for this method, and that the process of the '582 document appears to be inclusive of the claimed process.

However, in the method of the present invention, the valence change occurs only at a focal point and its vicinity due to irradiation with a condensed pulsed laser beam. The valence change is completed in a very short time period (for instance, one second). Furthermore, it is not necessary, in the method of the present invention, to make the wavelength of the pulsed laser beam consistent with the absorption wavelength of the rare earth and/or transition metal ion. Claim 8 specifically excludes situations in which the wavelength of the pulsed laser beam corresponds to the absorption wavelength of the rare earth and/or transition metal ion. The '582 document discloses irradiation of an optical material with a laser beam to change a valence of a rare earth or a transition metal element, but this irradiation with a laser beam must be continued for a long time (for instance, one hour as disclosed in Example 1) during synthesis or heat-treatment of the optical material, and the wavelength of the laser beam is controlled within a range including the absorption wavelength of an active ion. Condensation of a pulsed laser beam at a focal point inside the optical material is neither taught nor suggested by the '582 document.

In addition, the '582 document contains no teaching or suggestion of the use of a pulsed laser beam.

The Examiner asserts that the '695 document also discloses the process of irradiating an optical material containing an activator selected from a rare earth element or transition metal element with a light including a wavelength in a light absorption wavelength range of the activator. The Examiner concludes that the light having a different wavelength than the activator is utilized in addition to light having the wavelength of the activator.

However, as noted previously, the present invention is a method for bringing about valence change only at the focal point and immediate vicinity of irradiation produced by a condensed pulsed laser beam. The '695 document discloses valence change induced by irradiation with a laser beam, but does not teach or suggest condensation of a pulsed laser beam at a focal point inside the optical material. In the method of the '659 document, the laser beam with a wavelength within a region including the absorption wavelength of an active ion is applied to the optical material during synthesis or heat treatment, and a long period of time (for instance, 2 hours as disclosed in Example 1) is needed to produce a valence change. In addition, the '659 document contains no teaching or suggestion of the use of a pulsed laser beam.

For these reasons, the Examiner's rejection of claims 8-13 under 35 U.S.C. § 103(a) is believed to have been overcome.

In view of the above, it is submitted that the claims are in condition for allowance. Reconsideration of the rejections is requested. Allowance of claims 8-13 is respectfully requested.

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